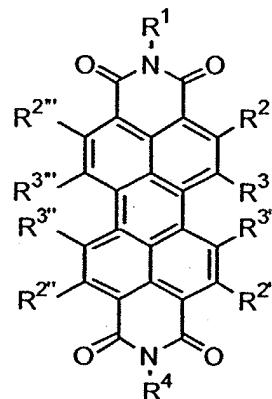


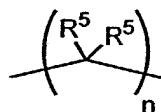
What is claimed is:

1. A method of reducing proliferative capacity of a cell comprising contacting said cell with a compound or a salt thereof or a stereoisomer of compound I
5 that has the formula:

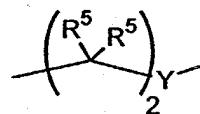


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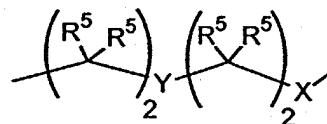
10 where R¹ and R⁴ are independently -L-A where L is a linking group having the formula:



where n is 1-3; and each R5 is independently H, Me, OH, or OMe;

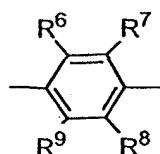


15 where R5 is as before and Y is O, S, SO, SO2, NH, NMe, or NCMe;



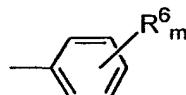
where R₅ and Y are as before and X is CH₂, O, S, SO₂, NH, NMe, or NCOMe;

5



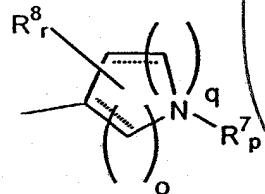
where R⁶, R⁷, R⁸, and R⁹ are independently H, OMe, OEt, halogen, or Me;

10

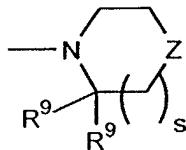


where m is 0-5 and R₆ is halogen, NH₂, NO₂, CN, OMe, SO₂NH₂, amidino, guanidino, or Me;

15

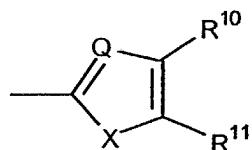


where o is 0-1; p is 0-2; q is 1-2 provided that when o + q is 2, in which case a pyrrolidine or pyrrole ring is indicated, or 3, in which a piperidine or pyridine ring is indicated; r is 0-3; R⁷ is H or Me; R⁸ is independently Me, NO₂, OH, CH₂OH or halogen, and when r is 2-3, two adjacent R⁸ substituents are -(CH=CH)2- or -(CH₂)4- to form an annulated six-membered ring;



where R^9 is independently H, Me, and when R^9 is O; s is 0-1; Z is CH_2 , O, NH, NMe, NET, $N(Me)_2$, $N(Et)_2$, or NCO_2Et ;

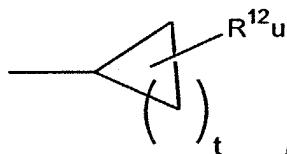
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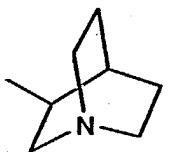
where Q is N, CH, NMe, or NET; X is O, S, NH, NMe or NET; R^{10} and R^{11} are independently H, Me, CH_2CO_2Et ; R^{10} and R^{11} taken together are $-(CH=CH)_2-$ or $-(CH_2)_4-$

10

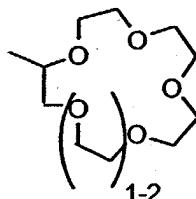
;



where t is 1-4; u is 0-4, and R^{12} is independently Me, OH,



;



;

15

CO_2R^{13} , $\text{CON}(\text{R}^{13})_2$, SO_3H , $\text{SO}_2\text{N}(\text{R}^{13})_2$, CN , $\text{CH}(\text{CO}_2\text{R}^{13})_2$, $\text{CH}(\text{CON}(\text{R}^{13})_2)_2$, $\text{N}(\text{R}^{13})_2$, or $\text{N}(\text{R}^{13})_3$ where R^{13} is H, Me, Et, or $\text{CH}_2\text{CH}_2\text{OH}$; and
 R^2 , $\text{R}^{2'}$, $\text{R}^{2''}$, $\text{R}^{2'''}$; R^3 , $\text{R}^{3'}$, $\text{R}^{3''}$, $\text{R}^{3'''}$ are each independently H, OMe, halogen, or NO_2 .

5

2. The method of claim 1 wherein the cell is a mammalian cell.

3. The method of claim 1, wherein the cell is a human cell.

10

4. The method of claim 1, wherein the cell is a cancer cell.

15

5. The method of claim 1, wherein said malignant cell is a breast cancer cell, a prostate cancer cell, liver cancer cell, a pancreatic cancer cell, a lung cancer cell, a brain cancer cell, an ovarian cancer cell, a uterine cancer cell, a testicular cancer cell, a skin cancer cell, a leukemia cell, a head and neck cancer cell, an esophageal cancer cell, a stomach cancer cell, a colon cancer cell, a retinal cancer cell, a bladder cancer cell, an anal cancer cell and a rectal cancer cell.

20

6. A method of reducing telomeric extension comprising administering a compound of claim 1 to a telomerase in the presence of a telomerase substrate.

25

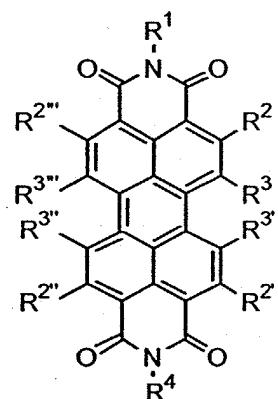
7. The method of claim 6, where the telomerase is in a cell.

8. The method of claim 1, wherein said compound further promotes apoptosis.

9. The method of claim 1, wherein said compound further promotes apoptosis in a cell.

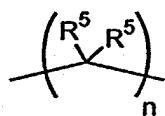
10. The method of claim 1, wherein the compound is a perylene compound.
11. The method of claim 1, wherein the compound is N,N'-bis(2-piperdinoethyl)-3,4,9,10-perylenetetracarboxylic acid diimide.
- 5
12. The method of claim 1, wherein the compound is N,N'-bis(2-dimethylaminoethyl)-3,4,9,10-perylenetetracarboxylic acid diimide.

10. A compound of the formula



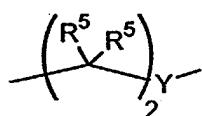
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where R¹ and R⁴ are independently -L-A where L is a linking group having the formula:

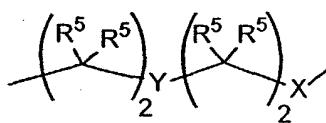


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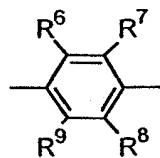
where n is 1-3; and each R⁵ is independently H, Me, OH, or OMe;



where R⁵ is as before and Y is O, S, SO, SO₂, NH, NMe, or NCOMe;

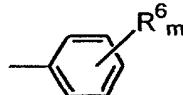


where R₅ and Y are as before and X is CH₂, O, S, SO, SO₂, NH, NMe, or
5 NCOMe;

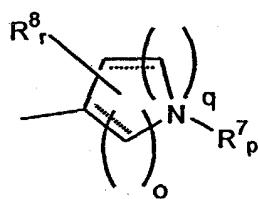


where R⁶, R⁷, R⁸, and R⁹ are independently H, OMe, OEt, halogen, or Me;

10 and A is a compound of the formula:



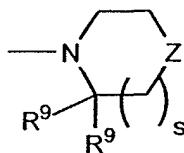
15 where m is 0-5 and R₆ is halogen, NH₂, NO₂, CN, OMe, SO₂NH₂, amidino, guanidino, or Me;



20 where o is 0-1; p is 0-2; q is 1-2 provided that when o + q is 2, in which case a pyrrolidine or pyrrole ring is indicated, or 3, in which a piperidine or pyridine ring

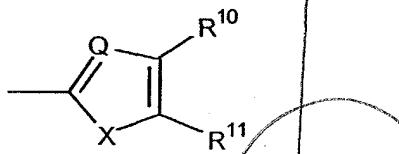
is indicated; r is 0-3; R⁷ is H or Me; R⁸ is independently Me, NO₂, OH, CH₂OH or halogen, and when r is 2-3, two adjacent R⁸ substituents are -(CH=CH)2- or -(CH₂)4- to form an annulated six-membered ring;

5



where R⁹ is independently H, Me, and when R⁹ is O; s is 0-1; Z is CH₂, O, NH, NMe, NET, N(Me)₂, N(Et)₂, or NCO₂Et;

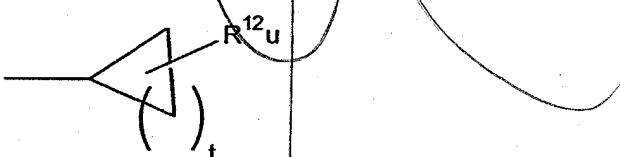
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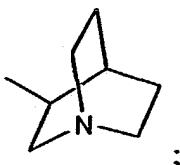
where Q is N, CH, NMe, or NET; X is O, S, NH, NMe or NET; R¹⁰ and R¹¹ are independently H, Me, CH₂CO₂Et, R¹⁰ and R¹¹ taken together are -(CH=CH)2- or -(CH₂)4-

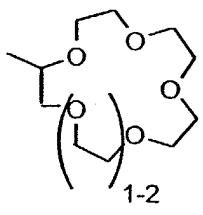
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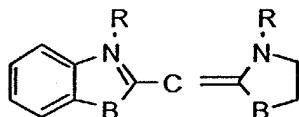
where t is 1-4; u is 0-4, and R¹² is independently Me, OH,





CO_2R^{13} , $\text{CON}(\text{R}^{13})_2$, SO_3H , $\text{SO}_2\text{N}(\text{R}^{13})_2$, CN , $\text{CH}(\text{CO}_2\text{R}^{13})_2$, $\text{CH}(\text{CON}(\text{R}^{13})_2)_2$,
10 $\text{N}(\text{R}^{13})_2$, or $\text{N}(\text{R}^{13})_3$ where R^{13} is H, Me, Et, or $\text{CH}_2\text{CH}_2\text{OH}$; and
 R^2 , $\text{R}^{2'}$, $\text{R}^{2''}$, $\text{R}^{2'''}$; R^3 , $\text{R}^{3'}$, $\text{R}^{3''}$, $\text{R}^{3'''}$ are each independently H, OMe, halogen, or
5 NO_2 .

14. A method of reducing proliferative capacity of a cell comprising contacting said cell with a compound having the formula II or a salt thereof or a stereoisomer of said compound:



10 II

where C is $-\text{CH}=\text{CH}-$, $-(\text{CH}=\text{CH})_2-$, $-(\text{CH}=\text{CH})_3-$, p-phenylene, o-phenylene, p-phenylene- $\text{CH}=\text{CH}-$, or o-phenylene- $\text{CH}=\text{CH}-$; B is O, S, or NR, and R is r Me or Et.

15 15. The method of claim 14, wherein the cell is a mammalian cell.

16. The method of claim 14, wherein the cell is a human cell.

17. The method of claim 14, wherein the cell is a cancer cell.

20

18. The method of claim 14, wherein said cancer cell is a breast cancer cell, a prostate cancer cell, liver cancer cell, a pancreatic cancer cell, a lung cancer cell, a brain cancer cell, an ovarian cancer cell, a uterine cancer cell, a testicular cancer cell, a skin cancer cell, a leukemia cell, a head and neck cancer cell, an esophageal cancer cell, a

stomach cancer cell, a colon cancer cell, a retinal cancer cell, a bladder cancer cell, an anal cancer cell and a rectal cancer cell.

19. A method of reducing telomeric extension comprising administering a
5 compound of claim 14, to a telomerase in the presence of a telomerase substrate.

20. The method of claim 19, where telomerase is in a cell.

10 21. The method of claim 14, wherein said compound further promotes
apoptosis in a cell.

22. The method of claim 14, wherein the compound is a carbocyanine.

15 23. The method of claim 22, wherein the carbocyanine is 3,3'-
diethyloxadicarbocyanine (DODC).

24. A method for identifying a candidate compound that inhibits telomerase
activity, comprising the steps:

20 a) obtaining the three-dimensional structure of a selected compound; and
b) determining the complementarity of the compound to telomere DNA
G-quadruplex

wherein a compound that exhibits at least 75% of the favourable intermolecular
interaction energy of the perylene diimide 2-d(TTAGGG)₄ complex structure is indicated
to inhibit telomerase activity.

25 25. A method of identifying a telomerase inhibitor comprising:

a) contacting a compound with DNA G-quadruplex; and
b) determining the melting point of the DNA G-quadruplex

30 wherein a compound exhibiting an increase in melting point of said quadruplex,
relative to unbound DNA G-quadruplex, is indicated to inhibit telomerase activity.

26. A method of identifying a telomerase inhibitor comprising the steps:

5 a) preparing a DNA G-quadruplex/dye complex wherein the dye is bound with the G-quadruplex;

b) contacting said complex with a candidate compound; and

c) determining displacement of said dye in the complex by said candidate, wherein displacement of the dye identifies the candidate as a telomerase inhibitor.

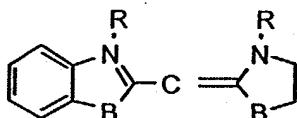
27. A method of identifying a telomerase inhibitor comprising:

10 a) contacting a candidate compound to be identified as a telomerase inhibitor with DNA G-quadruplex; and

b) determining the fluorescence or UV/VIS spectrum of the compound wherein an increase or decrease of the UV/VIS absorption or fluorescence emission intensity of said compound relative to the UV/VIS absorption or fluorescence emission intensity in the absence of DNA-G-quadruplex indicates telomerase inhibitory activity of the compound.

15

28. A compound of the formula:

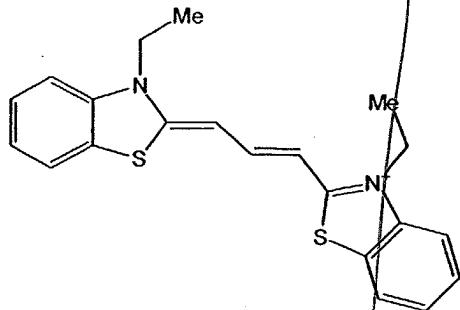


in which C is $-\text{CH}=\text{CH}-$, $-(\text{CH}=\text{CH})_2-$, $-(\text{CH}=\text{CH})_3-$, p-phenylene, o-phenylene, p-phenylene- $\text{CH}=\text{CH}-$, or o-phenylene- $\text{CH}=\text{CH}-$; B is O, S, or NR, and R is Me or Et.

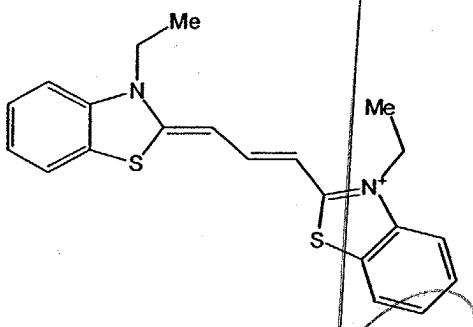
Additional Claims:

- 25
29. The method of claim 1, wherein the mitotic division of a cell is inhibited.
- 30
30. The method of claim 14, wherein the mitotic division of a cell is inhibited.

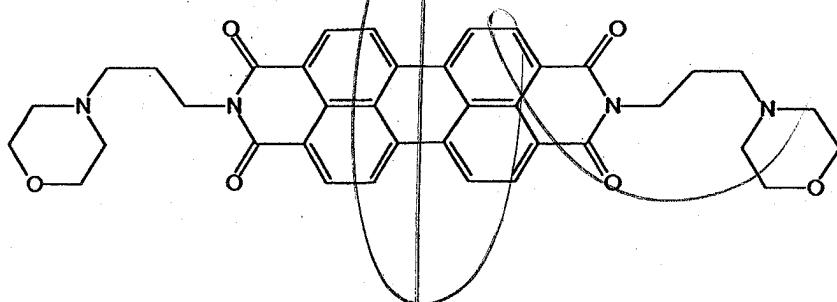
31. A compound of claim 28, having the structure:



5 32. The method of claim 14, having the structure:

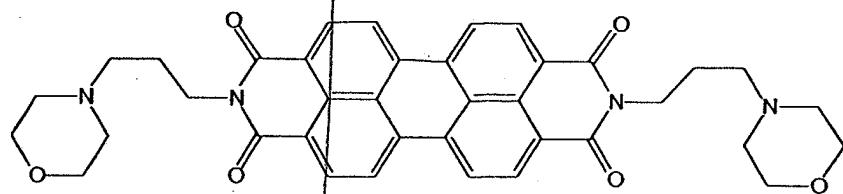


10 33. A compound of claim 13, having the formula:



34. The method of claim 1, having the formula:

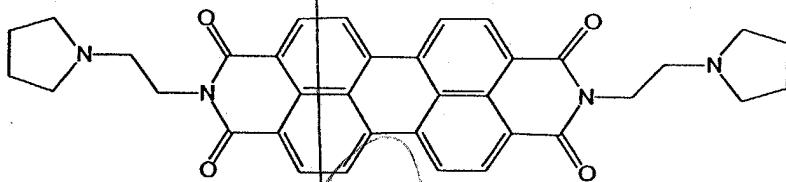
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35. The compound of claim 13, having the formula:

15



20

36. The method of claim 1, having the structure:

